Seismic-Workgroup St.-Michael-Gymnasium Monschau, Germany

From polystyrene-plates to a seismic-globe ...

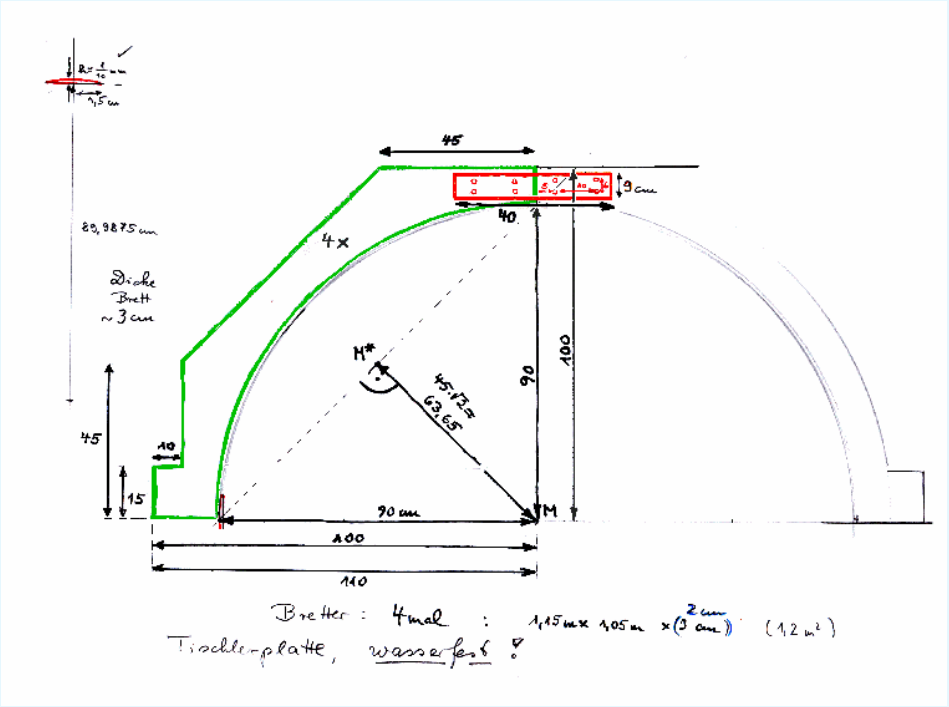
Polystyrene-plates sponsored by BASF (Ludwigshafen, Germany) being sawed out roughly

Daniel Thönnessen
&
Manuel Vossel
form 11 (2006)

A circular cut with a „hot wire arc“:
the plates being reshaped more precisely

Jan Reuter, Philipp Weiß & Mike Giese (Abitur 2007)

Math's being necessary …



The globe's socket

A gift from carpenter master Georg Siebertz

Globe-caps

A composite of polystyrene and cement
polished by stonecutter master Charly Goffart,
Monschau-Imgenbroich, Germany

End of Christmas-holidays 2006:
the globe's main body is completed

Philipp and Mike got assistance
by former seismic-group member
Sebastian Völl (Abitur 2005)

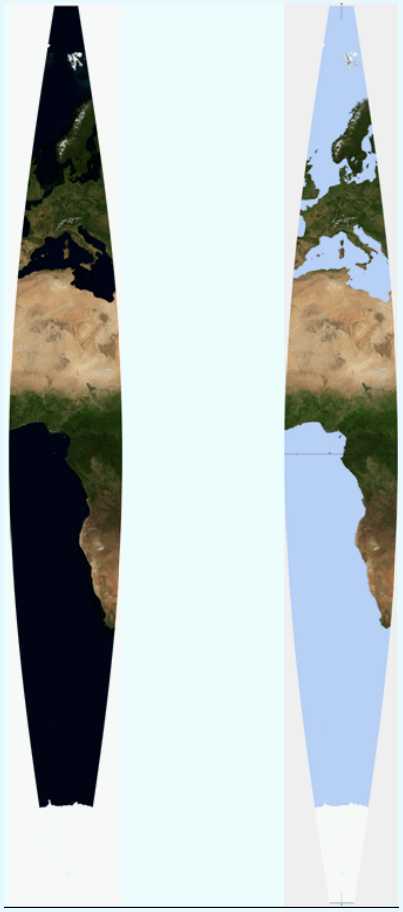
Positioning of layers and smoothening the surface

Jana Winkens Tamara Steffens Patrick Steinbeck Philipp Weiß
Annika Schmitz Marco Kraß

(Abitur 2007 and 2008)

Searching/defining the north-pole...

Manuel Vossel Tobias Kirch Sascha Treitz Thomas Stupp Tamara Steffens

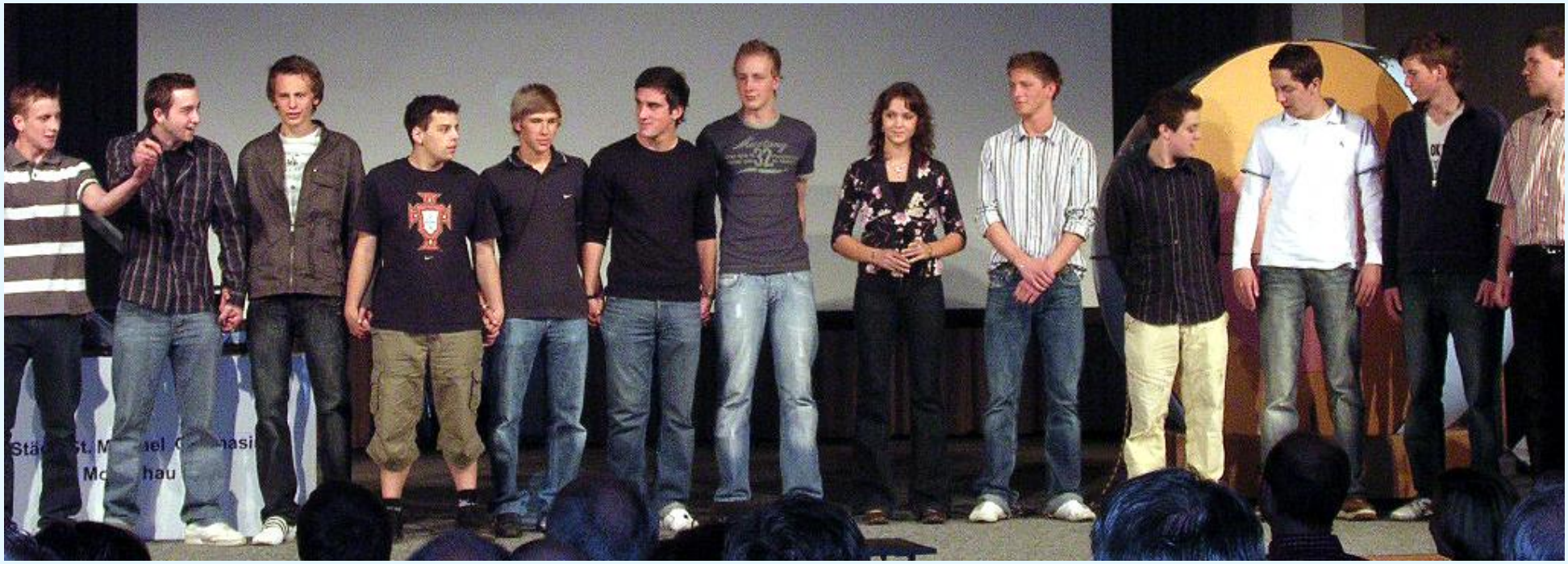


The original patterns are satellite-images (German Aerospace Center, Oberpfaffen-hofen, Bavaria)

The continents' contours were traced out manually, so lakes and seas could be coloured in a light blue

- Cover sheets are printed by WWM Gülz, Monschau -
(Dr.C. Coppeneur-Gülz, former student of MGM)

The students of the upper forms of the Seismic-WG presenting the globe
at the 10th anniversary of the WG
after giving a talk on earthquakes, wave-propagation and seismographs



Christian Kirch, Tobias Kirch, Daniel Thönnessen, Patrick Schmidt, Stefan Nießen, Sascha Treitz, Lukas Krass, Tamara Steffens, Robin Lamm, Tim Olschewski, Thomas Stupp, Thomas Müller, Manuel Vossel

How to locate a quake by our self-built three component school-station *) :
(forms 6- 10 of our WG)

Nina Welters (Thomas) Alberts | Max Hoff Valentin Küpper | Patrick Legros Lion Welters | Christian Naas Maike Löbl | Marvin Krings Sebastian Scheuer | Stefan Jollet Jens Krämer | Kevin Scheuer Fabio | Christian Huppertz (Lukas) Krass | Lukas Krings Felix Hoff | Mirco Klee

(Thomas Stupp and Lukas Krass helped spinning the globe)

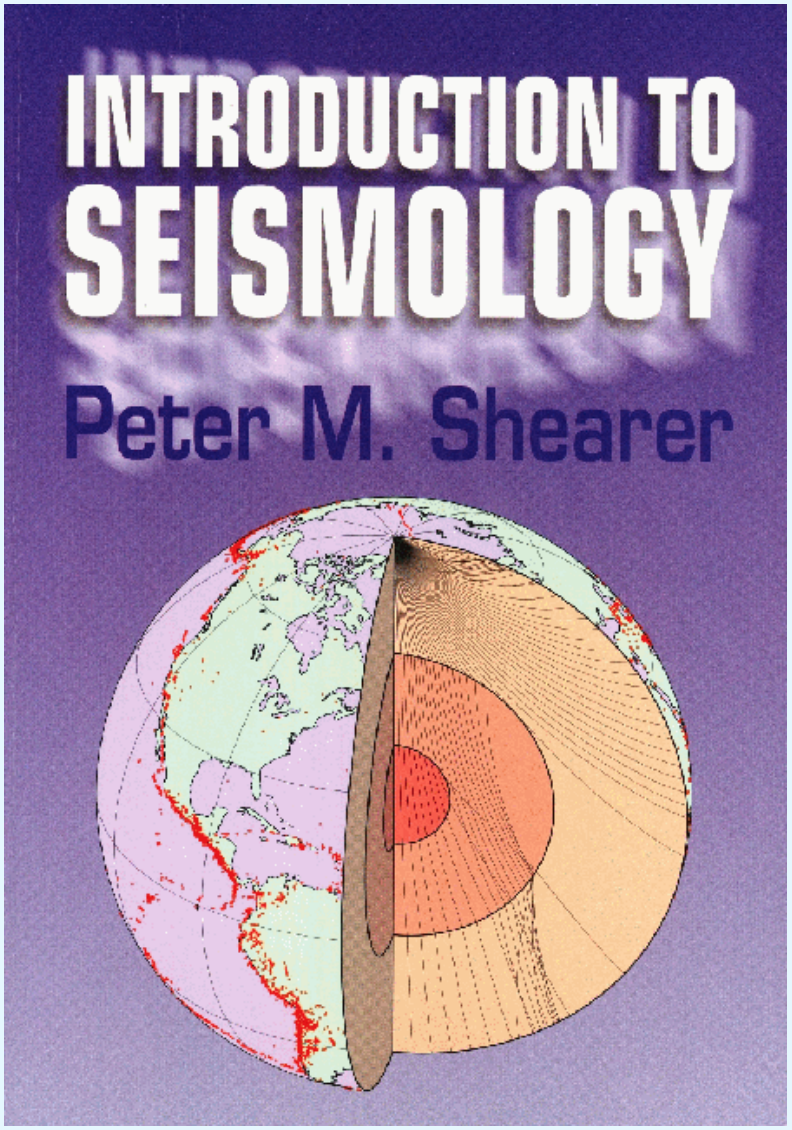
*) The school-seismograph-station was built in 1996 by our former students
Bernd Naeth, Thomas Poschen and Sebastian Schork (Young Researchers Competition),
see: http://www.mgm.monschau.de/seismic .

Scientific Maintenance

From its start the Seismic Work-Group got highly committed support by our scientific godfather

Professor Dr. Erhard Wielandt,
Institute of Geophysics,
University of Stuttgart, Germany .

Greetings from California



“I'm thrilled that my book cover has provoked such an interesting project! Attached is my original concept for the cover (Postscript and PDF files), which presents an undistorted view. This should give you what you need.
Let me know if there is anything else I can do to help. It would be fun to see a photo of the final version of the globe.”

Peter

Peter M. Shearer,
Professor of Geophysics

Institute of Geophysics
and Planetary Physics
Scripps Institution of
Oceanography

University of California,
San Diego

Note: how to outline plate-boundaries

- On continents or on the Mediterranean Sea area e.g. sketching of plate boundaries is easy, because sufficient orientation marks can be found.
- But, what is to do before the outline of the middle Atlantic ridge can be drawn on the entire blue area of the Atlantic Ocean ?

1. Draw a grid on the globe's surface with a 10.000 km/90° calliper.
2. Use USGS Plate-boundary database by Google-Earth and apply the boundaries on the surface.
3. Fit the grid tiles to the dimensions of our globe in Google-Earth.
   Rule of thumb: If the view height is 1350km above sea level, then the Iberian Peninsula appears at the same scale as on our globe.
4. Find the necessary "grid tile trajectory" for each plate boundary.
5. Print each concerning tile; copy each boundary part to a transparent foil and transfer it to the globe's surface.
6. Highlight the location of the boundaries finally by glue dots (red and yellow).
7. Remove the grid lines.

Draw a grid on the globe's surface with a 10.000 km/90° mask. (1)

(The picture was taken ex post.)

Preparation:
While drawing a meridian on our globe's surface it became obvious, that our globe doesn't match the shape of a sphere precisely:
The calliper (see next slide), since hanging loose, didn't allow to draw the meridian correctly.
Therefore a third point on the way from the pole to the equator was defined by a circle to be seen on the left.

Thomas Müller and Sabine Kirch (form 13 in 2008) are showing the problem's solution.

Draw a grid on the globe's surface with a 10.000 km/90° mask. (2)

Drawing meridians with 10° increments

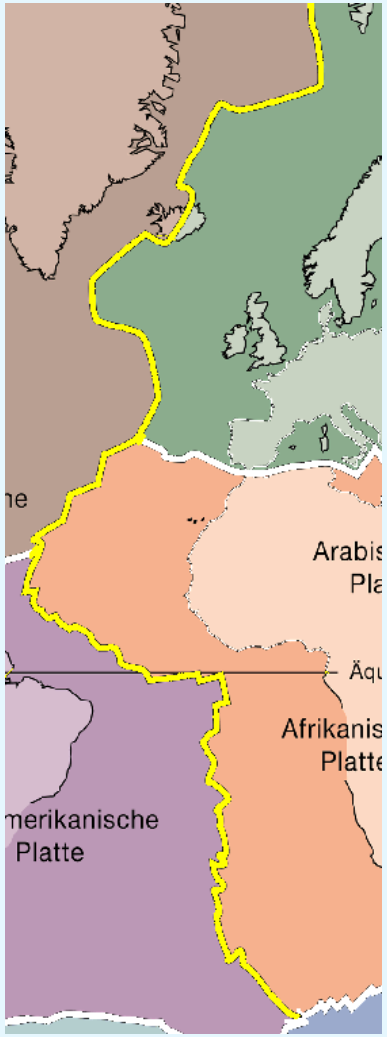
1111 km fit to 10°.

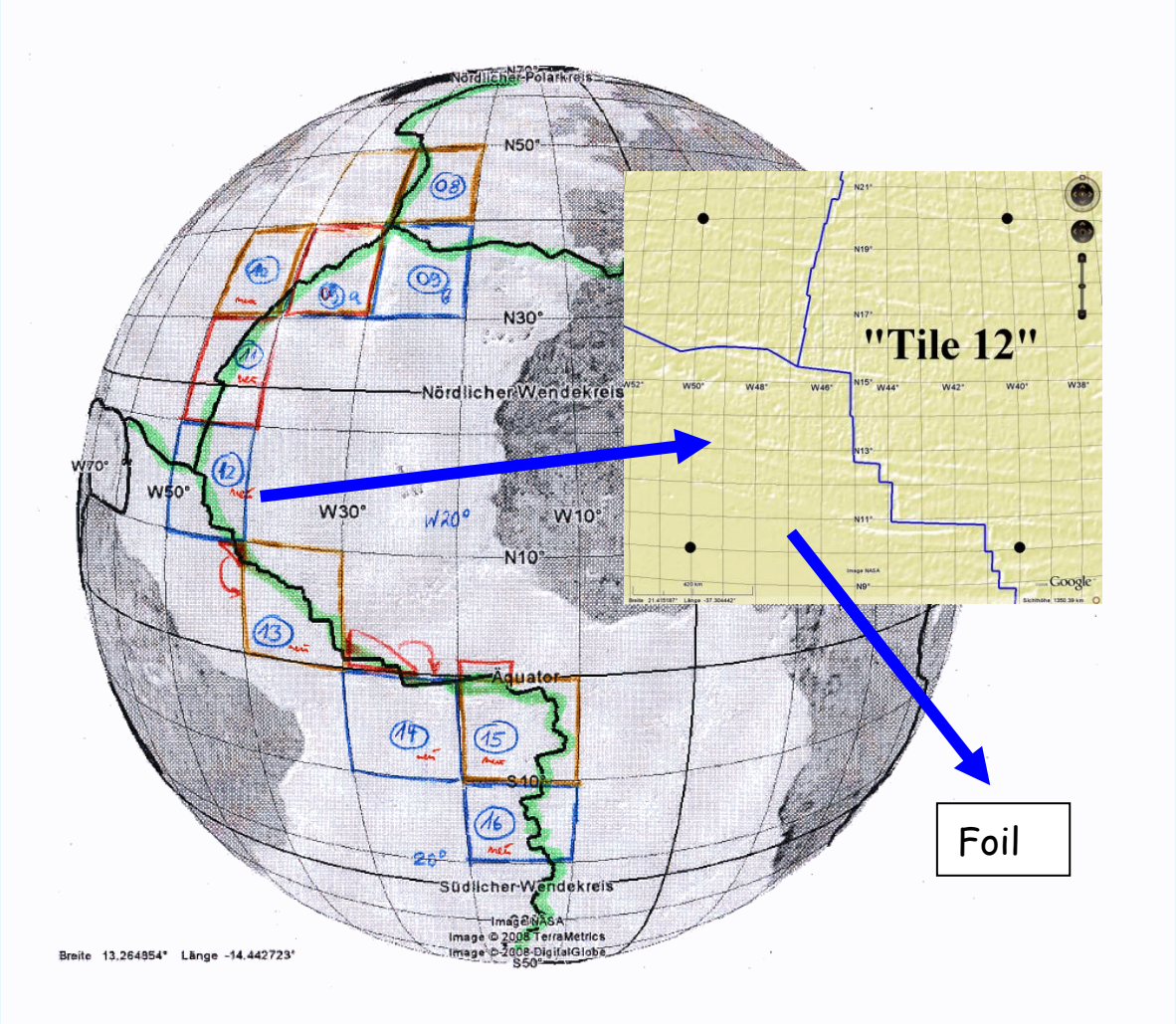
Maike Welters is drawing, Nina Welters and Stefan Nießen are assisting.

(The picture was taken ex post.)

Draw a grid on the globe's surface. (3)

Finding a grid trajectory of the middle oceanic rift of the Atlantic Ocean using the USGS Plate-boundary database by Google-Earth





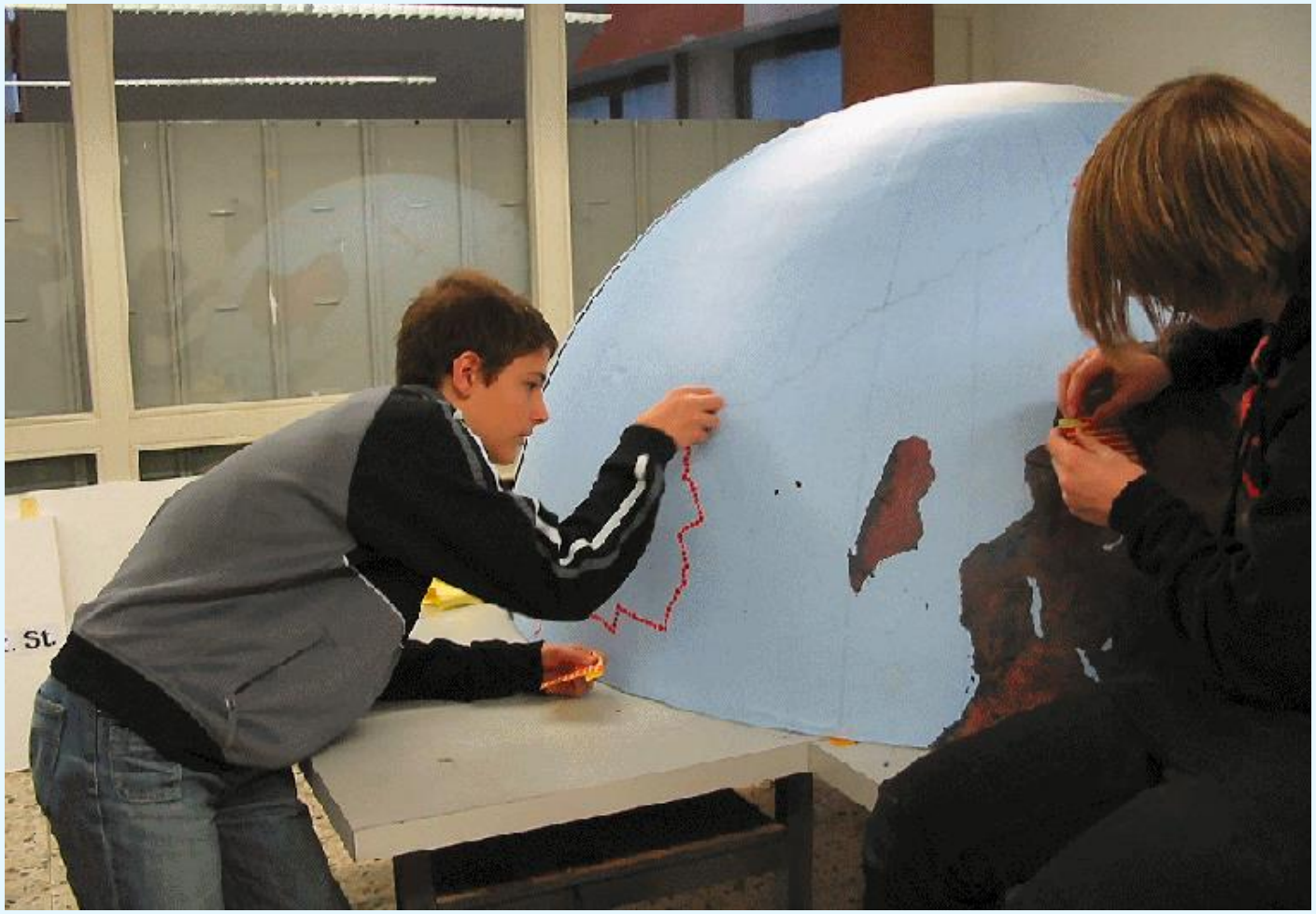
Transfer of a boundary part from a transparent foil to the globe's surface.

4 auxiliary points

Timo Woopen (form 11) is holding the foil.

Alexander Smit (form 7) is transferring a part of the Australian plate's boundary from the foil onto the globe.

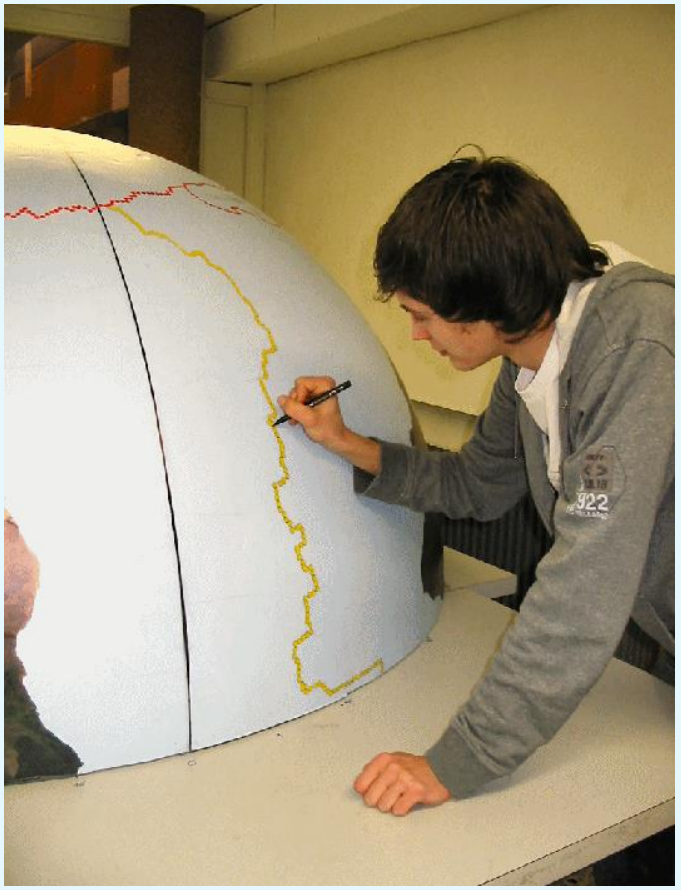
The plate boundaries are highlighted with glue dots.



Sebastian Löbl and Max Hoff (form 9) are working on the plate boundaries.

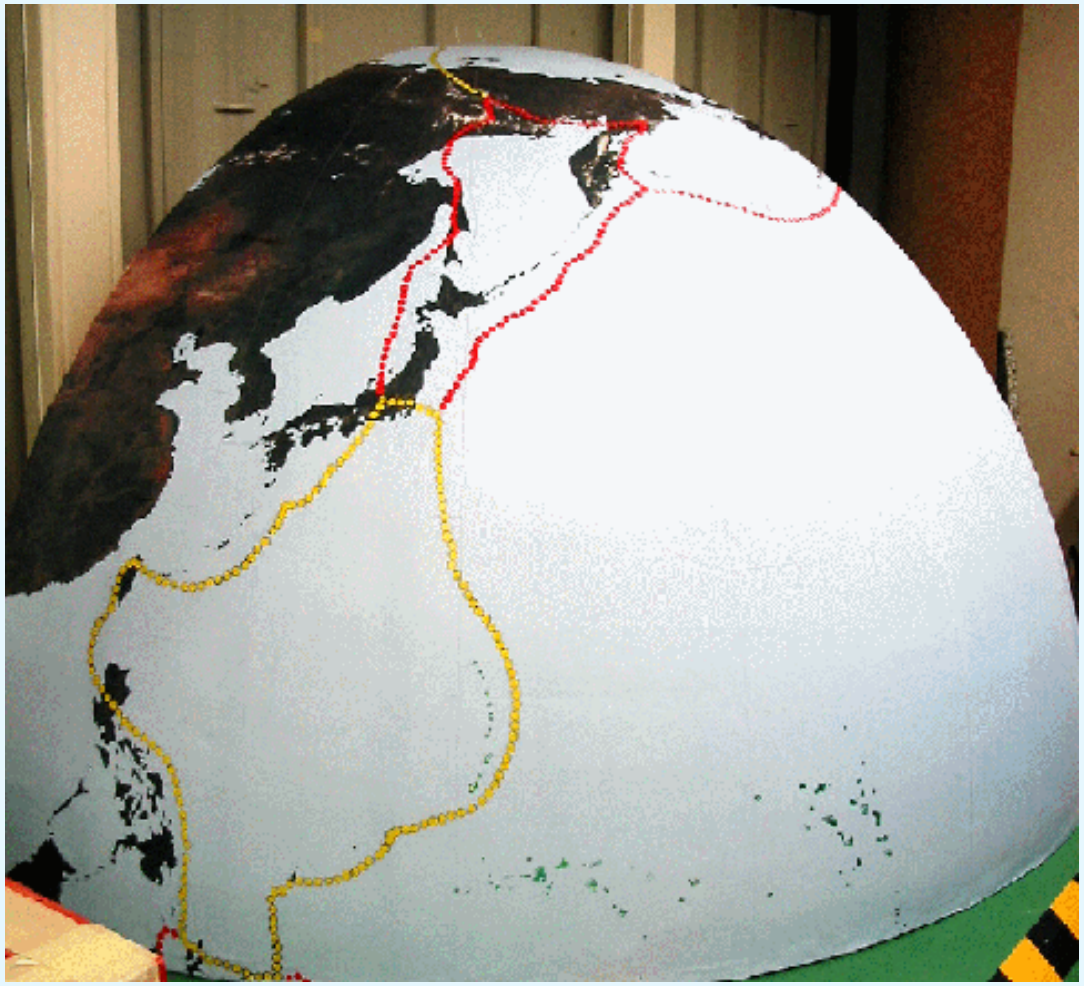
Difficult corrections and fine tuning

Shortly after assemblage of the two hemispheres of our globe it became obvious, that one plate boundary was "growing" in a wrong direction. Manuel and Daniel are correcting the mistake.



Daniel is drawing a black circle around each yellow glue dot in order to increase it's contrast to the light-coloured background.

Thomas removing the gridlines.

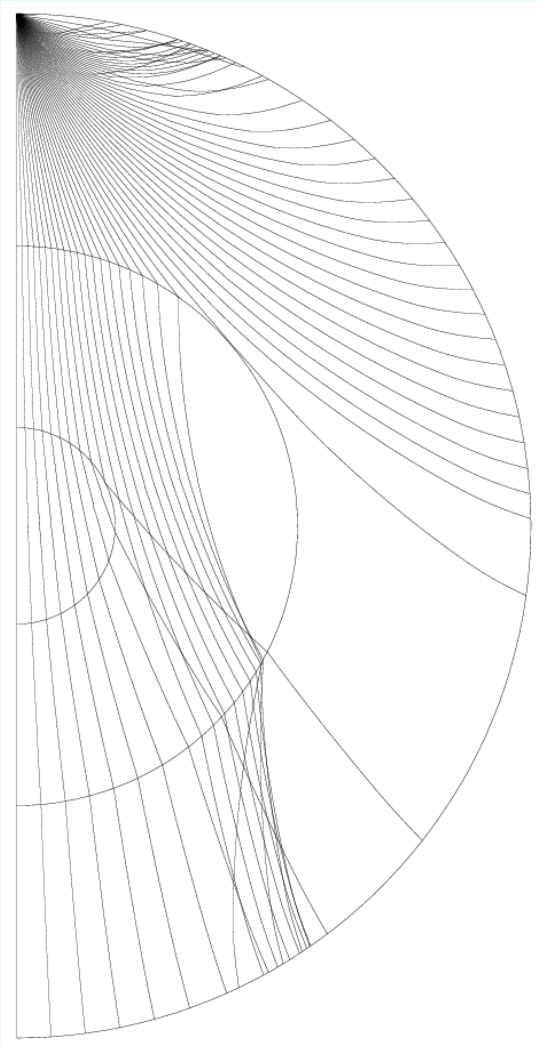


The Philippine Plate

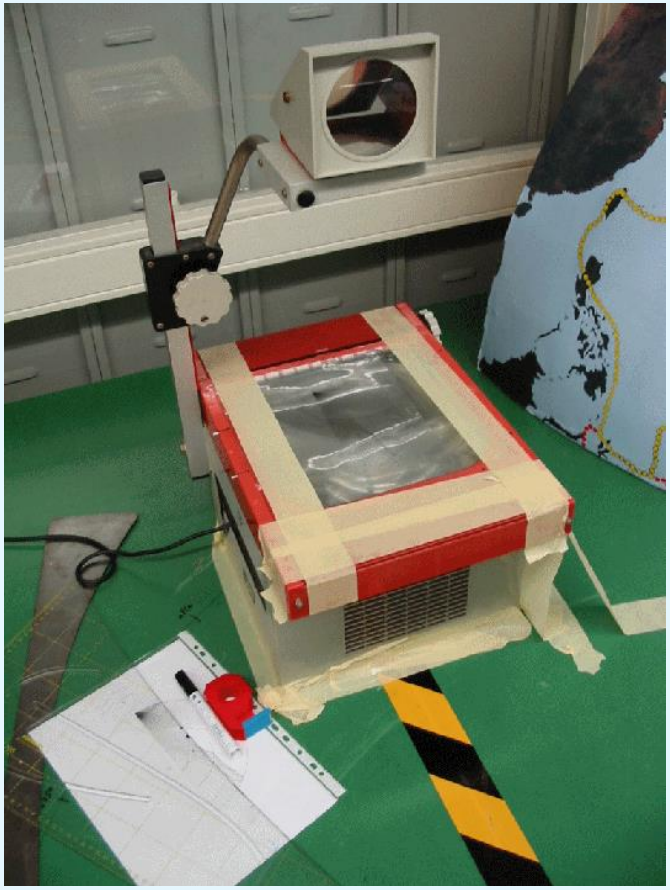
The Australian Plate

The Indian Plate

Drawing "Seismic Ray-Trajectories" of body waves (1)



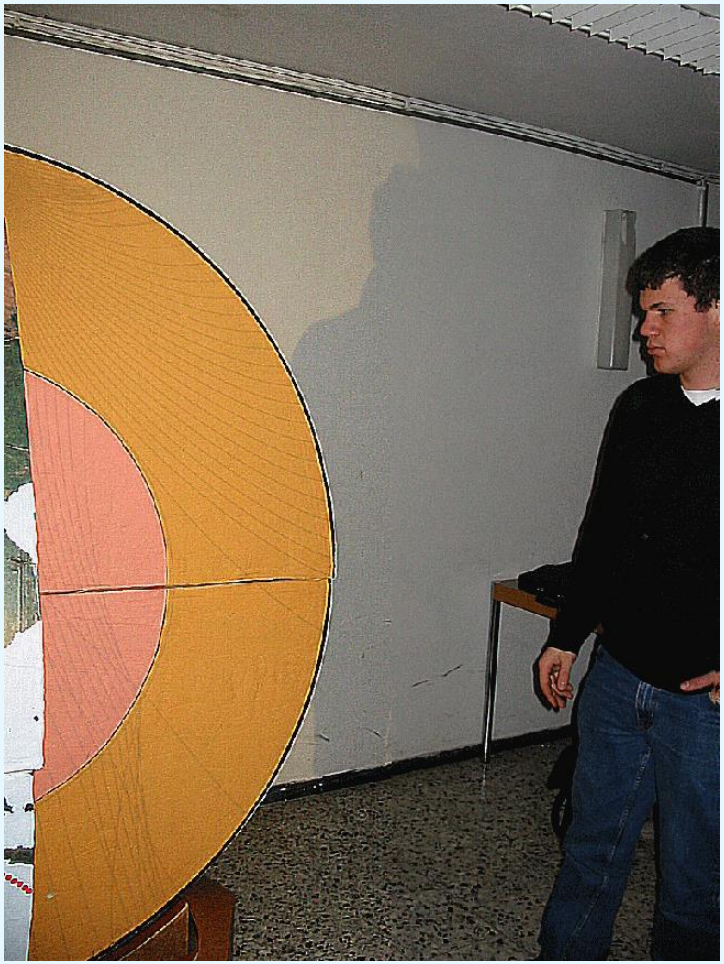
Professor Shearer's master …



… on the OHP

Drawing "Seismic Ray-Trajectories" of body waves (2)

Stefan is adjusting the OHP



Manuel eyeing up the projection's position on the globe.

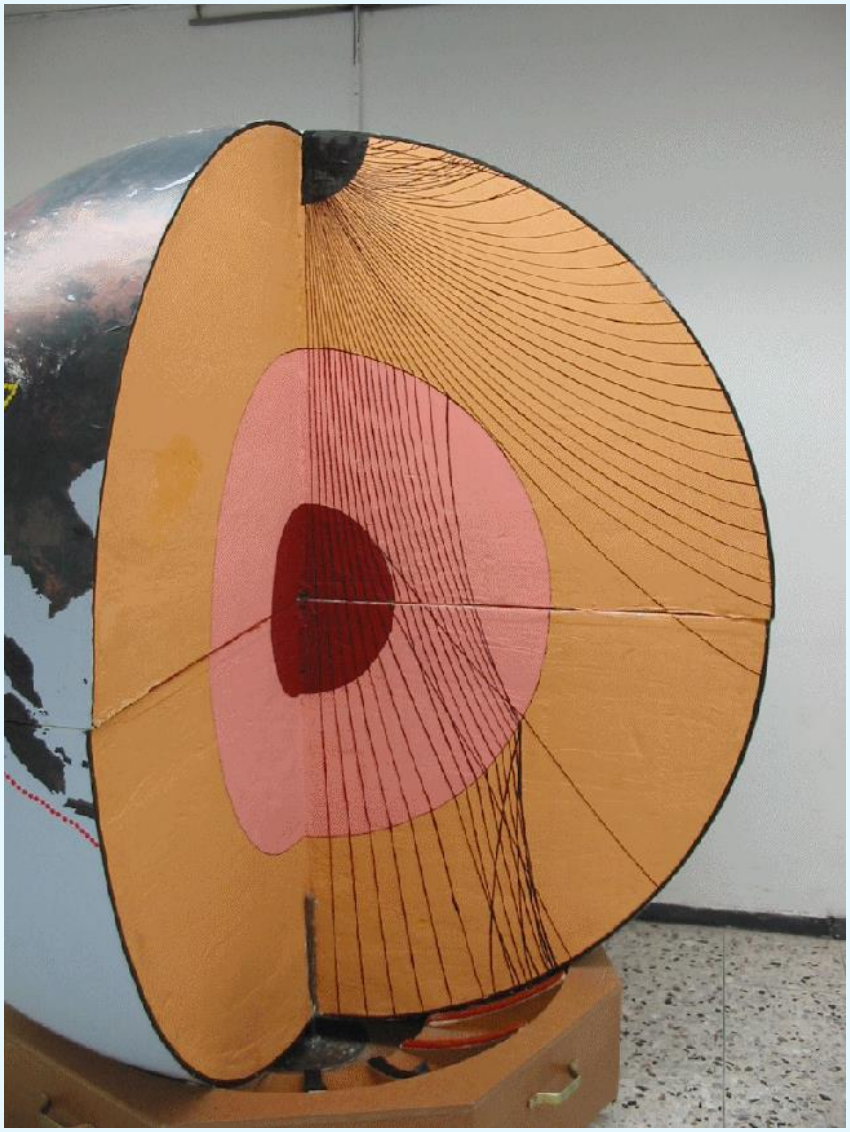
Drawing "Seismic Ray-Trajectories" of body waves (3)

Lukas and Robin tracing the master lines

Lukas and Stefan strengthening the lines.

Drawing "Seismic Ray-Trajectories" of body waves (4)

Rediscovering the old French Curve.



The final trajectories.

The globe – consisting partly out of flammable polystyrene – has to be housed outstairs ...

(1) A pavilion – already used and out of use now – was be sold by the society of school's friends VEFF for a fair price.
It had to be demounted ...

(2) ... being transported to school ...

(3) ... cleaned and remounted again.

Inside on the windows UV-foils were attached in order to prevent leaching out colors by sun's light. Thanks for sponsoring to **Myrenne Inc., Roetgen, Germany**.

Tim Olschewski refreshing parts of the Pavilion with a steam blaster.

Squattering the new Pavilion for our Seismic-Globe

Daniel Thönnessen

Manuel Vossel

Nina Welters

Tim Olschewski

Lukas Krass

Fredrik Söndgen

Maike Welters

Sedat Erdogmus

Stefan Nießen

Robin Lamm

02. 04. 2009:
the Globe is housed ...

by day ...

... and by night.